

WHAT IS CLAIMED IS:

1. A method of manufacturing a stamper for a focusing grating coupler, comprising the steps of:
 - forming a predetermined grating pattern of a metallic thin layer on a substrate;
 - forming a negative pattern having an inverse image to the grating pattern, by etching an exposed part of the substrate with a predetermined depth;
 - completing an embossing master having the negative pattern thereon, by removing the metallic pattern;
 - forming an anti-adhesion layer on a whole surfaces of the embossing master;
 - forming a stamper layer with a predetermined thickness on the anti-adhesion layer so that the negative pattern is completely buried; and
 - completing a stamper by separating the stamper layer from the embossing master, the stamper having a grating pattern of an inverse image to the negative pattern thereon.
2. The method as claimed of Claim 1, wherein the substrate is etched by a thickness of a focusing grating coupler to be formed, in order to form the negative pattern.
3. The method as claimed of Claim 1, wherein the anti-adhesion layer is formed with a metal.

4. The method as claimed of Claim 1, wherein the stamper layer is formed with a metal or a polymer.

5 5. A method of manufacturing a focusing grating coupler using a stamper, comprising the steps of:

sequentially forming a clad buffer layer, a core layer, a grating layer, and a polymer layer;

10 disposing a stamper on the polymer layer, the stamper having a negative pattern thereon;

forming a grating pattern having an inverse image to a grating pattern of the stamper, by pressing the stamper in the polymer layer;

removing the stamper; and

15 forming a focusing grating coupler composed of the grating layer on the core layer, by anisotropically etching the polymer layer and the grating layer,

wherein the stamper is fabricated by the steps of:

forming a predetermined grating pattern of a metallic thin layer on a substrate;

20 forming a negative pattern having an inverse image to the grating pattern, by etching an exposed part of the substrate with a predetermined depth;

completing a metallic pattern master having the negative pattern thereon, by removing the metallic pattern;

forming an anti-adhesion layer on a whole surfaces of the embossing master;

forming a stamper layer with a predetermined thickness on the anti-adhesion layer so that the negative pattern is completely buried; and

5 completing a stamper by separating the stamper layer from the embossing master, the stamper having a grating pattern of an inverse image to the negative pattern thereon.

6. The method as claimed of Claim 5, wherein the substrate is etched
10 by a thickness of a focusing grating coupler to be formed, in order to form the negative pattern.

7. The method as claimed of Claim 5, wherein the anti-adhesion layer is formed with a metal.

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8. The method as claimed of Claim 5, wherein the stamper layer is formed with a metal or a polymer.

9. The method as claimed of Claim 5, wherein the clad buffer layer is a
20 silica thin film, and formed with a thickness of 5 to 10 μm .

10. The method as claimed of Claim 5, wherein the core layer is formed with a material having a higher refractive index than that of the clad buffer layer.

11. The method as claimed of Claim 5, wherein the grating layer is formed with a material having a higher refractive index than that of the core layer.

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12. The method as claimed of Claim 5, wherein the grating layer is a silicon nitride film.

13. The method as claimed of Claim 5, when pressing the stamper in
10 the polymer layer, heat or ultra violet is irradiated.